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Assessing diagnostic coding practices among a sample of healthcare facilities in Lyme disease endemic areas: Maryland and New York – A Brief Report

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Summary

The value of using diagnostic codes in Lyme disease (LD) surveillance in highly endemic states has not been well studied. Surveys of healthcare facilities in Maryland (MD) and New York (NY) regarding coding practices were conducted to evaluate the feasibility of using diagnostic codes as a potential method for LD surveillance. Most respondents indicated that their practice utilized electronic medical records (53%) and processed medical/billing claims electronically (74%). Most facilities were able to search office visits associated with specific ICD-9-CM and CPT codes (74% and 73%, respectively); no discernible differences existed between the healthcare facilities in both states. These codes were most commonly assigned by the practitioner (82%), and approximately 70% of respondents indicated that these codes were later validated by administrative staff. These results provide evidence for the possibility of using diagnostic codes in LD surveillance. However, the utility of these codes as an alternative to traditional LD surveillance requires further evaluation.

Keywords

administrative codes; diagnostic codes; Lyme disease; surveillance

1 | INTRODUCTION

In 2014, Lyme disease (LD) ranked 5th among the most common nationally notifiable diseases with 33,461 cases reported to the Centers for Disease Control and Prevention (CDC). However, some studies have shown that the actual number of cases may be considerably higher due to underreporting and misclassification of cases (Meek, Roberts, Smith, & Cartter, 1996; Coyle et al., 1996; Orloski et al., 1998; Hinckley et al., 2014; Nelson et al., 2015). Even when LD cases are reported via physician or testing laboratory, investigation requires time-intensive information collection from several sources to classify a case, and case misclassification may still occur. Using electronic medical records has often

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been hypothesized as a potential way to more efficiently identify and investigate potential LD cases.

The International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes are utilized in healthcare settings to create an electronic account of the physician–patient visit and improve consistency in recording patient symptoms and medical services. Additionally, Current Procedural Terminology (CPT) codes are used to record services rendered by healthcare providers. Although they were not implemented for public health surveillance purposes, these codes provide a standardized language for documenting medical diagnoses and procedures and have been evaluated as a potential tool for public health surveillance for some communicable diseases (Jhung & Banerjee, 2009; Jones, Coulter, & Conner, 2013; Schaefer et al., 2010; Sickbert-Bennett, Weber, Poole, MacDonald, & Maillard, 2010). However, the value of these codes as they pertain to LD surveillance in highly endemic states has not been assessed. As a first step towards such an evaluation, the Maryland Department of Health and Mental Hygiene (MDHMH) and the New York State Department of Health (NYSDOH) surveyed providers to characterize their diagnostic coding practices in these two Lyme disease endemic states.

2 | METHODS

A group of healthcare providers and facilities in Maryland (MD) and New York (NY) known to diagnose and report LD cases were asked to complete a voluntary survey describing the use and assignment of diagnostic codes. In MD, the surveyed healthcare providers and facilities were identified from a 10% stratified random sample of confirmed, probable, and suspected LD cases and “not a case” reports captured in Maryland’s National Electronic Disease Surveillance System in 2009; these healthcare providers and facilities were located statewide. In NY, a comprehensive 2011, list of healthcare providers and facilities was provided to study staff by the NYSDOH Office of Health Insurance Programs for Albany, Onondaga and Washington Counties in NY. These counties were chosen because they reflected both urban (Albany, Onondaga) and rural (Washington) areas with both established (Albany, Washington) and new (Onondaga) LD ende-micity. Specialties likely to regularly see patients with LD were surveyed. These included general/family practice, internal medicine, paediatrics, dermatology, orthopedics and emergency medicine, among others.

The same survey was used in both states. Surveys contained questions regarding the following: whether facilities’ medical records were paper or electronic; the professional background and years of experience of personnel assigning the codes at patient visit; and the number and specialties of the providers at the facility. Follow-up phone calls were made to the facilities to answer any questions and encourage timely submission of the surveys. A descriptive analysis of survey results was conducted using Microsoft® Excel 2007 (MD) and Microsoft® Excel 2013 (NY).

The survey protocols were reviewed by Institutional Review Boards in their respective states, as well as at CDC.

3 | RESULTS

In MD, 292 facilities were identified that accounted for the 474 patients sampled from NEDSS. Six per cent ($n = 17$) of MD facilities were identified as individual locations that were part of five larger healthcare facilities or corporate urgent care chains; therefore, these five central offices provided responses for their respective affiliated locations as part of their survey responses. In MD, 184 surveys were completed, including by 15 (8%) hospitals, 42 (23%) single provider offices and 127 (69%) multiprovider practices, yielding a response rate of 63%.

In NY, 588 facilities were identified and contacted by phone to determine the appropriate person to whom a survey about their coding and billing practices should be sent. Two hundred seventeen (36%) of the healthcare facilities were not eligible to participate in the study because they (i) did not see patients with Lyme disease, (ii) had shut down/closed or (iii) had out of service phone numbers. Of the remaining 371 facilities, 213 (37%) indicated they did not want to participate in the survey. Fifteen were identified as individual locations of larger healthcare facilities that provided responses for their affiliated locations. In total, 158 facilities were mailed a survey. Fifty-six surveys were completed representing a total of 98 healthcare facilities, including four (4%) hospitals, 32 (33%) single provider practices and 62 (63%) multiprovider practices, yielding a response rate of 62% among those who agreed to participate in the survey.

Despite the different approaches in identifying providers and facilities to survey, data here are reported in aggregate. Tables 1 and 2 show data broken down by state. Administrative personnel in healthcare facilities were most commonly responsible for completing surveys in both MD and NY, completing 40%. Most respondents indicated their practice utilized electronic medical records (53%) and processed medical/billing claims electronically (74%). Nearly three-quarters of all facilities could search for visits associated with specific ICD-9-CM and CPT codes (74% and 73%, respectively, Table 1). The majority (82%) of healthcare facilities in both states surveyed indicated the practitioner initially assigned diagnostic codes. However, the proportion of practitioners initially assigning codes was higher in single and multiprovider facilities (MD 84%; NY 97%) compared to hospitals. Surveys from hospitals in MD indicated that both administrative/billing or medical record staff and practitioners (13%; 27%, respectively) primarily assigned diagnostic codes, whereas surveys from NY hospitals showed that all codes were assigned by administrative/billing or medical record staff (100%). The majority (62%) of respondents indicated that codes were typically presented to the initial coder utilizing a standard sheet or drop-down menu. However, at least 35% of respondents indicated codes were presented in a variety of other formats (e.g., auto-populated menus). Approximately 70% of respondents indicated that these codes were later evaluated for accuracy; in most cases (57%), this validation was completed by administrative or billing staff.

4 | DISCUSSION

The survey results provide an initial evaluation of the feasibility of using diagnostic codes for LD surveillance, particularly in highly endemic states, by assessing their availability

from a variety of medical practices and facility types. Overall, most responding healthcare facilities indicated they could electronically search medical records. Those facilities that are unable to search for codes do not appear to be different than those that can (data not shown). Those that are unable may just have not yet adopted the software and other technologies that allow for searching.

Passive infectious disease surveillance is best when performed consistently. Of note in the survey results is that the process of assigning and validating codes was performed by different members of the healthcare team. Over half of the coders used a standard sheet or drop-down menu when selecting codes, though many respondents identified codes from a variety of other formats. This variation for code selection may introduce inconsistencies in the final "coded" diagnosis and potentially reduce code utility for surveillance efforts, though further research is warranted to better characterize these potential inconsistencies both within and across facilities.

The two states administering this survey, while using the same instrument, used different methods to select practices to be surveyed. While this may be unorthodox, it represents the many differences between states when it comes to disease surveillance. The resulting data, regardless of the selection process, reflect the abilities of these facilities in both states to access administrative codes.

The increased use of automated and electronic systems in the healthcare industry has allowed most healthcare facilities to easily search administrative codes electronically. Despite using different sampling methods in MD and NY, our results provide some evidence that LD diagnoses might be identifiable from administrative codes extracted electronically from medical and billing records. However, these codes were not intended for disease surveillance, and their utility in accurately identifying LD cases and serving as a useful alternative to traditional LD surveillance requires further evaluation as described elsewhere in this journal by Rutz, Wee, & Feldman (2016).

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Impacts

- This study explores the feasibility of using diagnostic codes as a Lyme disease surveillance tool by surveying healthcare facilities for their accessibility in two Lyme disease endemic states.
- Most healthcare facilities utilizing electronic medical records can search for specific visits based on Lyme disease diagnostic codes, though variations in the practice of code assignment exist across healthcare facilities.
- Using diagnostic codes as a potential alternative to traditional Lyme disease surveillance requires further evaluation.

TABLE 1

Use of electronic medical records and ability to search for ICD-9/CPT codes

	Maryland *n* = 184	**New York *n* = 98**	**Combined data (MD; NY) *n* = 282**
Electronic processing of Medical/Billing Claims			
Yes	132 (75%)	40 (71%)	172 (74%)
No	37 (21%)	11 (20%)	48 (21%)
Uncertain	6 (3%)	5 (9%)	11 (5%)
Total	175	56	231
Able to Search for ICD9-CM			
Yes	128 (70%)	49 (88%)	177 (74%)
No	26 (14%)	2 (4%)	28 (12%)
Uncertain	28(15%)	5 (9%)	33(14%)
Total	182	56	238
Able to Search for CPT			
Yes	123 (69%)	48 (86%)	171 (73%)
No	28 (16%)	3 (5%)	31 (13%)
Uncertain	28 (16%)	5 (9%)	33 (14%)
Total	179	56	235

TABLE 2

Initial diagnostic code assigner by facility type

Hospitals	**Maryland (*n* = 15)**	**New York (*n* = 4)**
Practitioner	4 (27%)	0 (0%)
Administrative	2 (13%)	4 (100%)
Missing	9 (60%)	0 (0%)
Total	15	4
Single and multiprovider practices	**Maryland (*n* = 169)**	**New York (*n* = 94)**
Practitioner	142 (84%)	91 (97%)
Administrative	18 (11%)	3 (3%)
Other/missing	9 (5%)	0(0%)
Total	169	94